

Task **3.2.5 – Micro Scale Technology Demonstration: Project Development and Engineering**
Subject: **Deliverable 3.2.5.2 – Pre-Demonstration Summary Report**

Draft Report
Pre-Demonstration Summary Report

NOVEMBER 7, 2003

Renewable Energy Research Program
To Make Renewables Part of California's
Affordable and Diverse Public Power System

CONTRACT # 500-01-042

Commission Project Manager: Val Tiangco
Contractor Project Manager: Fred Weiner – SFPUC
Contractor Program Manager: Ray Dracker - CRS
Subcontractor: Scott Haase - McNeil Technologies

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1 INTRODUCTION

This Draft Report provides preliminary data, analysis, conclusions, and recommendations regarding the information necessary to proceed with the biomass technology demonstration project.

The goal of Task 3.2.5, Micro Scale Technology Demonstration: Project Development and Engineering, is to coordinate all aspects of the technology demonstration project. The team will take the results and information developed under the previous tasks on this project and plan a suitable demonstration project in the TDPUD service territory. The project will seek to document the costs, energy generation, economic performance, technical performance, emissions and other criteria associated with running the BioMax technology developed by Community Power Corporation (CPC) of Littleton, Colorado in a small load center. To accomplish the task goals McNeil will 1) coordinate with the Recreation Center, CPC, and TDPUD to analyze specific details of the project (host site needs, utility interconnection agreements, safety, fuel supply, operating requirements, permits, etc.), 2) conduct engineering design studies and technology modifications as needed, and 3) make arrangements for system procurement, financing and installation.

In furtherance of these objectives, McNeil shall 1) make all arrangements to locate a host site for the demonstration project and coordinate between the host site, the utility, and CPC, 2) work with CPC, the host utility, power marketers and others to ensure that the generator characteristics of the BioMax system match as closely as possible the high value requirements of the system, 3) evaluate interconnection requirements, including safety, equipment needs, buy-back rate, provisions for net metering, and assist the host as necessary in procuring permits, and 4) work with all parties to determine how the system and technology demonstration project will be financed, including, as appropriate, the use of California Energy Commission funds. McNeil will also prepare the final agreements for the technology demonstration signed by all parties and a pre-demonstration summary report.

2 HOST SITE SELECTION

Site selection for the 15-kW unit has been completed. The BioMax will be demonstrated at the Truckee Recreation Center. An agreement between CPC and the host utility has been drafted and presented in association with another deliverable under this task. Site requirements for the BioMax system are provided in Appendix A.

3 BIOMAX SYSTEM GENERATION CHARACTERISTICS

Information about the BioMax system is provided in Appendix B. Fabrication is well on its way to completion and testing of the system is expected soon, if it has not already been completed. More details on fabrication and internal testing is provided in the deliverable for 3.2.5c.

4 INTERCONNECTION REQUIREMENTS INCLUDING PERMITTING

The energy from the biomass technology demonstration project will be accepted by TDPUD under the terms of a net metering interconnection agreement. A prototype of such an agreement is provided as Appendix C.

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5 FUEL SUPPLY

The system will use approximately 400 lb/day of fuel, assuming 8 hours per day of operation (see Appendix A). TDPUD will use wood fuel from their line clearance operations to the extent possible to reduce fuel supply costs and provide an outlet for some of the material they generate internally.

6 SYSTEM FINANCING

The fabrication of the system is being completed with CEC funds. We are presently compiling cost information for the Balance of System components including slab, building, heat exchanger, electrical and ducting, construction and interconnection gear. We will then attempt to locate a local source for these funds. TDPUD will assist in locating additional funding.

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Appendix A. Site Specifications from Community Power Corporation

Fuel & Fuel Processing

- 1) Wood source
 - a. Wood should be chipped rather than shredded for use as fuel. Long, fibrous or shredded pieces of wood may get hung up either in the feeding mechanism or the gasifier.
- 2) Size and sorting requirements
 - a. Wood chips should be sorted to eliminate oversize pieces; this can be accomplished with the integrated sorting screen in our fuel daybin or with a supplemental system.
 - b. Sawdust and undersize chips do not need to be removed as long as they don't comprise more than 10-15% of the wood chips by weight.
 - c. An expanded metal screen can be used for sorting overs
 - i. We use a $\frac{3}{4}$ No. 16 Ryex expanded metal screen which can be purchased in 4' x 8' sheets from Ryerson.
 - ii. Our technique for screening involves a metal screen framework insert for the daybin feeder with a vibrator attached to the screen.
- 3) Wood type and content
 - a. Suitable wood species are Lodgepole Pine, Ponderosa Pine, Douglas Fir or similar species; check with CPC to confirm suitability.
 - b. Bark content is not a problem as long as it does not comprise more than about 10-15% of the wood chips by weight.
 - c. Care should be taken to avoid mixing dirt and stones in with the wood chips as these can cause the feeding mechanisms or gasifier to malfunction. These materials can mix with the wood if the wood is stored on the ground and scooped up with a front end loader.
- 4) Moisture content
 - a. Fresh cut wood needs to be air dried to about 20-25% moisture content before it can be used on the SMB system
 - b. CPC's fuel feeder/drier mechanism uses waste heat from the cooling system to perform additional wood drying; it is expected to be able to perform additional drying to reduce the moisture content from about 20-25% down to 10-15% which is ideal for the gasifier system.
 - c. At CPC we are able to spread the wood chips in a thin layer on a concrete pad for effective passive solar drying. It takes 1-2 days to dry chips in this manner depending on season and weather.
 - d. Other means of performing preliminary drying can be explored in consultation with CPC.

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- e. Moisture content can be measured with a small inexpensive hand held meter and fuel moisture should be checked as frequently as required to assure adequate drying of incoming fuel and proper (drying) function of the feeder/drier subsystem.
- 5) Storage
 - a. Wood chips should be stored in a covered location away from the effects of rain or snow.
 - b. Chips with high moisture content, which are stored in sealed containers or large piles, may ferment or even spontaneously combust.
 - c. Chips should be stored with a reasonable amount of air circulation.
- 6) Daybin storage
 - a. The system daybin will hold about 3-6 hours of fuel depending on power delivery and fuel consumption rates.
 - b. The daybin can be loaded either manually or with a bucket loader.
 - c. The daybin is attached to an automated feeder which delivers and meters fuel automatically to the gas production module.
- 7) Consumption rates
 - a. System fuel consumption will be approx. 3 lbs/hr/kWe
 - b. Total consumption will be approximately 400 lbs/day assuming 15kWe average x 8 hrs.

Ventilation

- 1) System should be operated in a well ventilated location such as a carport or open shed
- 2) If air flow is restricted the engine exhaust should be vented to the outside; engine exhaust pipe runs should be kept as short as possible to avoid backpressure and efficiency losses
- 3) Redundant CO detectors should be in place to protect against any buildup of carbon monoxide
- 4) In the event of an emergency shut down the system may emit small quantities of smoke.

Noise

- 1) The gas production module and feeding equipment are relatively quiet. Only the intermittent sound of electrical motors and vibrators can be heard
- 2) The genset has critical grade sound attenuation; noise levels should be < 70dB at 7 meters.
- 3) A shed that has sound attenuating walls will help dissipate noise.

Electrical

- 1) Access to on-site 120 VAC single phase is needed for cleanup systems, tools, and possibly diagnostic equipment
- 2) Power delivery from the unit will be to a dedicated load distribution panel.
- 3) Specific on site requirements may include a transformer or transfer switch.

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- 4) Routing of power cables should be considered before the system is installed to avoid wiring runs that may create a hazard (under foot, etc.)

Propane

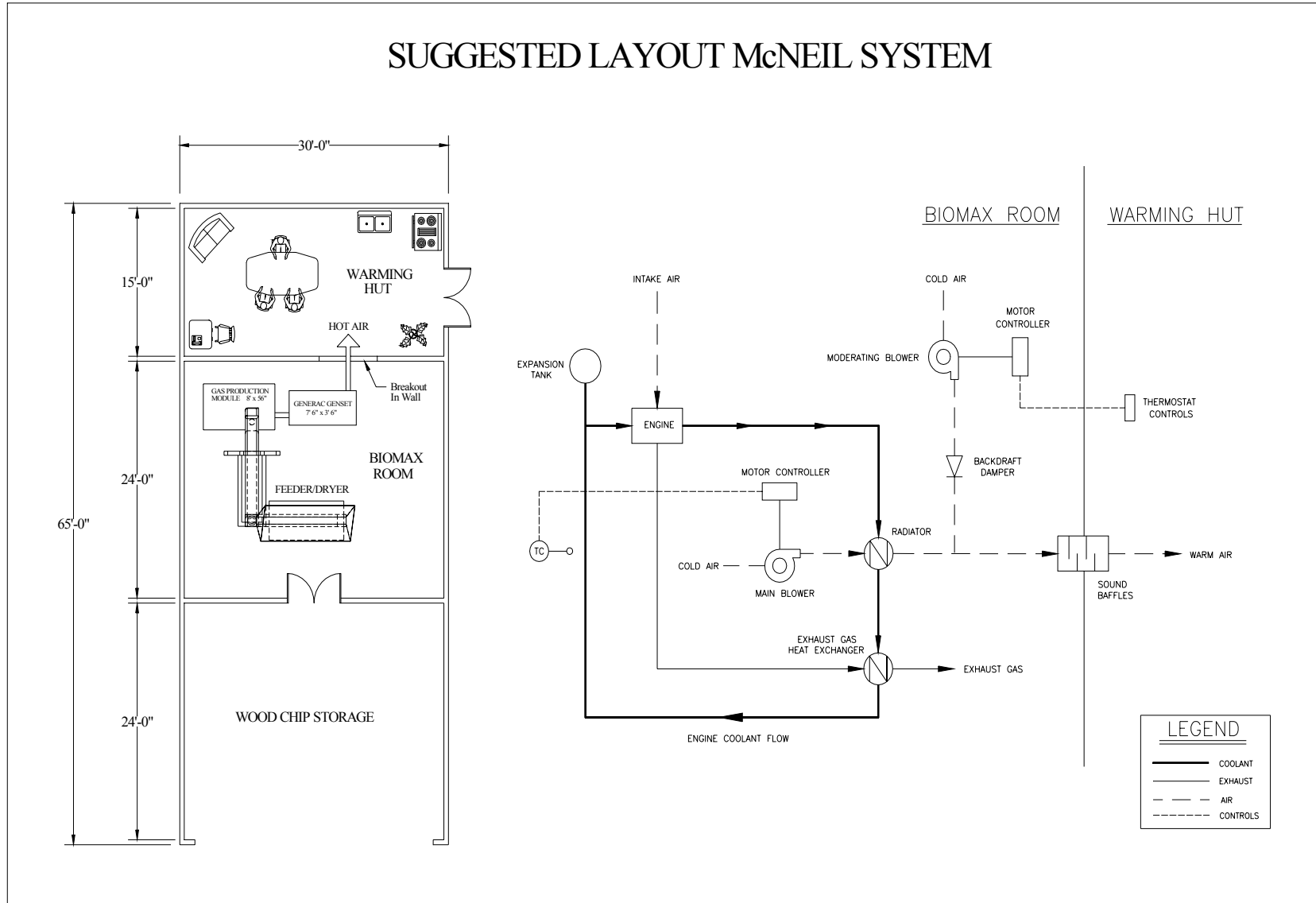
- 1) The system requires LPG (can take liquid or vapor); needs to be high pressure (100 psi GA)
- 2) Location of tank & delivery lines need to be installed in compliance with local codes.
- 3) LPG and delivery lines are supplied by the site; the SMB genset has a ¼ NPT female inlet for LPG hookup
- 4) Site is required to supply an in line filter/strainer at the entry to the genset
- 5) LPG usage rate approx 2 kg per startup cycle

Layout

- 1) The suggested site layout (Figure 1) is based on a three contiguous room building design with suggested dimensions for a warming hut, Biomax equipment room and wood chip storage shed. The warming hut layout and dimensions are strictly for sake of illustration since nothing is known about the requirements for this area.
- 1) Equipment should be mounted on a level pad with sufficient strength to support the weight of the units (see below); the pad should be smooth enough to move the units on self-contained wheels
- 2) Some mounting attachments to the pad may be required if the units show any tendency to creep during operation

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Logistics

- 1) Forklift
 - a. Required for lifting units off of truck and into final operating locations
- 2) Four pieces
 - a. Genset –112”L x 38”W x 54”H including wooden skid; 2000 lbs
 - b. Gas production module – 96”L x 56”W x 78”H; built in forklift pockets; 1500 lbs
 - c. Feeder daybin – 130”L x 48”W x 73”H; no skid; 1000 lbs
 - d. Drier assembly – 144”L x 60”W x 36”H; no skid; 600 lbs

Safety

- 1) Need redundant CO monitors in area
- 2) Need fire extinguishers for emergencies
- 3) Need safety glasses for visitors
- 4) Need signs for limited access or use areas
- 5) Need particulate masks fitted to operators for cleanup operations
- 6) Above safety equipment will be supplied by CPC and safety training will be conducted by CPC’s field engineer.

Installation & Field Support

- 1) A dedicated CPC field engineer will support installation and system commissioning on site.
- 2) The field engineer will also perform on site training for system operators.
- 3) Operation and maintenance documentation will be supplied with the system.
- 4) Installation is expected to take one day.
- 5) System commissioning is expected to take one to two days depending on problems.
- 6) On site training is expected to take two days.
- 7) CPC’s lead electronics engineer (Dusty Duncan) will be the customer’s point of contact for the duration of the project
 - a. Customer will be given a cell phone # to reach the field engineer at any time; other members of CPC can be reached during normal business hours
 - b. Response time to respond to a call will be within 24 hours
 - c. Field engineer will first try to fix any problems by working with the on site operator
 - d. Response time to fix a problem on site will be within 4 working days from failed attempts to fix the problem through phone consultations
 - e. Some spare parts will be supplied with the unit; other spares will be stockpiled at CPC’s facilities.

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Maintenance

- 1) An industrial vacuum system will be supplied for removing charcoal and ash from the system
 - a. Vacuum has HEPA rated filters which remove particulates as small as 0.3 microns with 99.999% efficiency
 - b. Vacuum collects material into a drum lined with a plastic trash can liner; liner can be tied up and disposed through normal waste channels
 - c. Two drums collect solid wastes during the run
 - i. Char bin below the reverse flow inertial separator (char pot)
 - ii. Filter drum
 - d. Extraction method (char bin)
 - i. Wait until system is cooled down (minimum 12 hrs)
 - ii. Leave valve open above the char bin
 - iii. Remove rupture disk and shield
 - iv. Turn PGM (engine genset) on for 1 minute to purge residual gases from the cooling and cleanup system
 - v. Detach the drum from the valve
 - vi. Clamp air inlet adaptor to the 3 inch opening and vacuum adaptor to the 4 inch opening
 - vii. Turn on vacuum for approximately 30 seconds or until the bin is empty
 - viii. Inspect and replace the graphoil gasket between the valve and char bin if necessary.
 - ix. Extract the char fines from the filter vessel (see below)
 - x. Remove extraction fittings, replace the rupture disk & shield and reattach the bin to the valve fitting
 - e. Extraction method (filter vessel)
 - i. Wait until system is cooled down (minimum 12 hrs)
 - ii. Perform extraction while the char bin is removed from the char pot and the valve is opened and after the system is purged
 - iii. Remove rupture disk and shield
 - iv. Clamp vacuum adaptor to the 4 inch opening
 - v. Operate the vibrator motor on the bottom of the drum during extraction
 - vi. Turn on vacuum for approximately 30 seconds or until the bin is empty
 - vii. Replace the rupture disk and shield
 - viii. Make sure to complete the char bin closure steps
- 2) No liquid residues or sticky tar residues are created or collected for removal.

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- 3) Typical daily routine
 - a. Empty char bins with vacuum
 - b. Char & fines production approx. 10-20 lbs/day
 - c. Review data from previous run
 - i. if dP across the heat exchangers was > ____ open for inspection and cleaning
 - ii. if dP across gasifier was > ____ open gasifier for inspection and cleaning
- 4) Typical weekly routine
 - a. Open and inspect gasifier; remove any clinkers (stones or lumps of fused ash) and vacuum grate
 - b. Inspect char air injector; open any clogged holes
 - c. Inspect and vacuum soot from heat exchanger entrances
 - d. Inspect bag filter & safety filter
 - e. Pressure test system
- 5) Typical biweekly routine
 - a. Change engine oil approximately after every 100 hours of operating time
 - b. Inspect feeder dryer and remove any sawdust buildup
- 6) Monthly inspection
 - a. Remove gasifier and perform full inspection, removing grate and injector
 - b. Full inspection of both heat exchangers
 - c. Individual component pressure test
 - d. Full inspection of filter bag, internal cage and vessel interior
 - e. Remove and inspect engine intake components
 - f. Clean safety filter

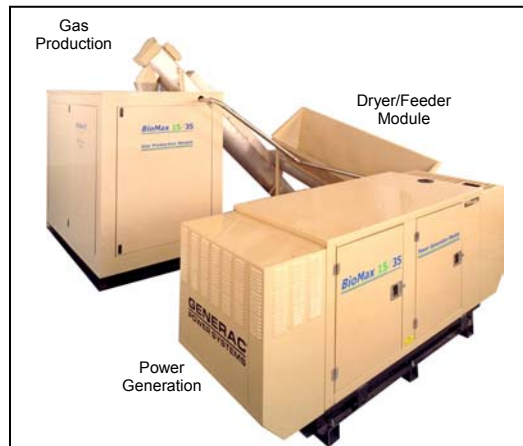
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Appendix B. BioMax 15 Demonstration Site Requirements – Truckee Donner Public Utility District

Background

This project will demonstrate the operation of the BioMax™, a new, small modular biopower system under development by Community Power Corporation (CPC) of Littleton, Colorado. The on-going development of this technology is the result of contributions by the US National Renewable Energy Laboratory, USDOE, California Energy Commission, the US Forest Service, Community Power Corporation, and other organizations.



The goal is to develop a new line of small modular biopower systems for the 21st Century suitable for distributed generation applications and capable of using a variety of woody biomass fuels including forest and agricultural residues to generate power and heat in an environmentally acceptable manner. CPC has designated this line of modular biopower systems as the BioMax™, with peak power modules from 2.5 kWe to eventually 100 kWe. The BioMax system that will be demonstrated under this project with the Truckee Donner Public Utility District (TDPUD) and will produce a peak power on wood-gas of 15 kWe.

The BioMax 15 is now at a pre-commercial stage of development. This field trial will reveal ways to strengthen the system and provide valuable inputs to guide and accelerate the product improvement and commercialization process.

Objectives of the Field Demonstration

- Conduct a field-based demonstration of the BioMax 15 to generate power (and possibly) heat to support operations at an on-grid facility
- Monitor the operation and performance of the BioMax 15 to provide inputs for product improvement
- Promote the use of small modular biopower systems for on and off-grid applications in the State of California
- Determine the economics of operating small modular biopower systems in distributed generation applications
- Measure and compare the emissions of the BioMax system with other distributed generation power systems of the same size

Demonstration Site Characteristics

Location: TDPUD service territory

Accessibility: Highly accessible, paved road, close as possible to service center

Loads:

Dedicated load:

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Up to 15 kW, single or three phase, daytime load, no motor larger than 10 hp

Parallel with Grid: No restrictions

Hours of Operation: Up to 8 hours per day

Applications:

Ideal: Grid parallel with main Truckee/Donner service center

Possible: Water pumping station, secondary service center, rural enterprise, e.g., wood working shop, green house, etc.

On-site O&M Labor

Two persons to be trained and capable of independent operation and maintenance of the BioMax system. One person assigned as prime attendant and one person as back-up.

Daily O&M: up to 1 hour of attendant labor for:

- wood chip loading and sorting
- component check list
- periodic vacuuming of filters
- disposal of bags of char/ash from filters (approx. 1, 40 gal. garbage bag each day)
- operational data downloading from control system

Weekly O&M: 1 hour of attendant labor for wood chip preparation and handling (assumes use of 4 cylinder chipper with wood scraps on site)

Facility / Equipment Requirements

Shelter: BioMax System: Simple building, min. 20ft x 30ft, paved floor, min. 12 ft clearance, powered roof ventilator, sliding doors front and rear. Storage shelves and cabinet for tools and maintenance supplies

Wood Chipping, Storage and Handling: Periodic use of 4 cylinder wood chipper, covered area for wood chip storage (20 ft. x 20 ft.)

Responsibilities of Parties

Community Power Corporation will provide one BioMax 15 including the Gas Production Module, Power Generation Module, Dry/Feeder Module and Grid Interface Module. CPC will transport and install the system, provide on-site training for attendants and will provide full system warranty and technical support throughout the duration of CPC's contract.

The Site Sponsor will provide everything required to house, connect, fuel, operate and maintain the BioMax system on site during the period of the field trial. Any thermal applications (CHP) and emissions measurements will be the responsibility of the Site Sponsor.

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Appendix C. Interconnection Agreement for Net Energy Metering

Interconnection Agreement for Net Energy Metering

_____ (customer-generator) and Truckee Donner Public Utility District (District) referred to collectively as “parties” and individually as “party,” agree as follows:

1. BIOMASS GENERATING FACILITY

1.1 Address: _____

1.2 Facility will be ready for operation on or about: _____

1.3 Location of District designated switching center: _____

1.4 Location of District customer service center: _____

1.5 Operating option – Customer-generator has elected to operate its biomass generating facility in parallel with District’s distribution facilities. The biomass generating facility is intended primarily to offset part or all of the customer-generator’s own electrical requirements.

2. PAYMENT FOR NET ENERGY

2.1 In the event the energy generated by the facility exceeds the energy consumed on the customer-generator’s premise during any billing period, payment for net as-available energy delivered to District shall be determined by an average, non-time-of-delivery price.

2.2 District reserves the right to apply the value of District’s purchase of energy toward any bill to customer-generator for electric service by District to customer-generator at the location in Section 1.1. Customer-generator shall pay any amount owing for electric service provided by District in accordance with electric rate schedule D-NM [schedule name may need to be changed]. Nothing in this Section 2.2 shall limit District’s rights under applicable tariff schedules.

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3. PRICE FOR NET ENERGY

- 3.1 On and after the date District gives its written approval for parallel operation pursuant to Section 5.4, District shall pay customer-generator for net as-available energy at prices authorized from time to time by the District and which are derived from District's monthly average non-firm electric energy price the District pays during the applicable month.

4. INTERRUPTION OR REDUCTION OF DELIVERIES

- 4.1 District shall not be obligated to accept or pay for, and may require, customer-generator to interrupt or reduce deliveries of as-available energy: (a) when necessary in order to construct, install, maintain, repair, replace, remove, investigate or inspect any of its equipment or part of its system; or (b) if it determines that curtailment, interruption or reduction is necessary because of emergencies, forced outages, force majeure or compliance with prudent electrical practices.
- 4.2 Whenever possible, District shall give customer-generator reasonable notice of the possibility that interruption or reduction of deliveries may be required.
- 4.3 Notwithstanding any other provision of this agreement, if at any time District determines that either (a) the facility may endanger District personnel or (b) the continued operation of customer-generator's facility may endanger the integrity of District's electric system, District shall have the right to disconnect customer-generator's facility from District's electric system. Customer-generator's facility shall remain disconnected until such time as District is satisfied that the condition(s) referenced in (a) or (b) of this Section 4.3 have been corrected.

5. INTERCONNECTION

- 5.1 Customer-generator shall deliver the as-available energy to District at the utility's meter.
- 5.2 Customer-generator shall pay for designing, installing, operating and maintaining the biomass generating facility in accordance with all applicable laws and regulations and shall comply with District's Appendix A [will need to be a different Appendix, written for the biomass facility – as such it is not attached in this specific document], which is attached hereto.

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- 5.3 The customer-generator shall install adequate protective devices to protect his equipment from overcurrent, over or under voltage, switching, transients, and lightning.
- 5.4 District shall furnish and install a standard watt-hour meter. Customer-generator shall provide and install a meter socket and related equipment.
- 5.5 Customer-generator shall not commence parallel operation of the generating facility until written approval of the interconnection facilities has been given by District. Such approval shall not be unreasonably withheld. District shall have the right to have representatives present at the initial testing of customer-generator's protective apparatus.
- 5.6 The customer-generator shall insure the delivery of only 60-Hz electric power into the District's system and at the designated service voltage.
- 5.7 Upon notification, the customer-generator will within ten (10) days from notification eliminate any radio or television interference and/or any other power quality problems that may arise from the customer-generator's biomass generation.

6. MAINTENANCE AND PERMITS

- 6.1 Customer-generator shall: (a) maintain the biomass generating facility and interconnection facilities in a safe and prudent manner and in conformance with all applicable laws and regulations including, but not limited to, District's Appendix A [as appropriate] and (b) obtain any governmental authorizations and permits required for the construction and operation of the biomass generating facility and interconnection facilities. Customer-generator shall reimburse District for any and all losses, damages, claims, penalties or liability it incurs as a result of customer-generator's failure to obtain or maintain any governmental authorizations and permits required for construction and operation of customer-generator's generating facility.

7. ACCESS TO PREMISES

- 7.1 District may enter customer-generator's premises: (a) to inspect at all reasonable hours customer-generator's protective devices and read or test meter; and (b) to disconnect, without notice, the interconnection facilities, if, in District's opinion, a hazardous condition exists and such immediate action is necessary to protect persons, or District's facilities, or property of others from damage or interference caused by

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customer-generator's biomass facilities, or lack of properly [word in original agreement was property – think it should be properly] operating protective devices.

8. INDEMNITY AND LIABILITY

- 8.1 Each party as indemnitor shall defend, save harmless and indemnify the other party and the directors, officers, employees and agents of such other party against and from any and all loss, liability, damage, claim, cost, charge, demand, or expense (including any direct, indirect, or consequential loss, liability, damage, claim, cost, charge, demand or expense, including attorneys' fees) for injury or death to persons including employees of either party and damage to property including property of either party arising out of or in connection with (a) the engineering, design, construction, maintenance, repair, operation, supervision, inspection, testing, protection or ownership of, or (b) the making of replacements, additions, betterments to, or reconstruction of, the indemnitor's facilities; provided, however, customer-generator's duty to indemnify District hereunder shall not extend the loss, liability, damage, claim, cost, charge, demand or expense resulting from interruptions in electrical service to District's customers other than customer-generator. This indemnity shall apply notwithstanding the active or passive negligence of the indemnitee. However, neither party shall be indemnified hereunder for its loss, liability, damage, claim, cost, charge, demand or expense resulting from its sole negligence or willful misconduct.
- 8.2 Notwithstanding the indemnity of Section 8.1, and except for a party's willful misconduct or sole negligence, each party shall be responsible for damage to its facilities resulting from electrical disturbances or faults.
- 8.3 The provisions of this Section shall not be construed to relieve any insurer of its obligations to pay any insurance claims in accordance with the provisions of any valid insurance policy.
- 8.4 Except as otherwise provided in Section 8.1, neither party shall be liable to the other party for consequential damages incurred by that party.
- 8.5 If customer-generator fails to comply with the insurance provisions of this agreement, if any, customer-generator shall, at its own cost, defend, save harmless, and indemnify District, its directors, officers, employees, agents, assignees and successors in interest from and against any and all loss, liability, damage, claim, cost, charge, demand or expense of any kind or nature (including attorneys' fees and other costs of litigation) resulting from the death or injury to any person or damage to any property, including the personnel and property of District, to the extent that District would have

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been protected had customer-generator complied with all such insurance provisions. The inclusion of this Section 8.5 is not intended to create any express or implied right in customer-generator to elect not to provide any such required insurance.

9. INSURANCE

- 9.1 Customer-generator shall maintain, during the term of this agreement comprehensive personal liability insurance with a combined single limit of not less than one-hundred thousand dollars (\$100,000) for each occurrence.
- 9.2 Such insurance required in Section 9.1 shall, by endorsement to the policy or policies, provide for thirty (30) calendar days written notice to District prior to cancellation, termination, alterations, or material change of such insurance.
- 9.3 District shall have the right to inspect or obtain a copy of the original policy or policies of insurance.
- 9.4 Customer-generator shall furnish the required certificates and endorsements to District prior to commencing operation.
- 9.5 All insurance certificates, endorsements, cancellations, terminations, alterations and material changes of such insurance shall be issued and submitted to the following:

Truckee Donner Public Utility District
P.O. Box 309
Truckee, CA 96160

10. GOVERNING LAW

- 10.1 This agreement shall be interpreted, governed and construed under the laws of the State of California as if executed and to be performed wholly within the State of California.

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11. AMENDMENT, MODIFICATION OR WAIVER

11.1 Any amendments or modifications to this agreement shall be in writing and agreed to by both parties. The failure of any party at any time or times to require performance of any provision hereof shall in no manner affect the right at a later time to enforce the same. No waiver by any party of the breach of any term or covenant contained in this agreement, whether by conduct or otherwise, shall be deemed to be construed as a further or continuing waiver of any such breach or a waiver of the breach of any other term or covenant unless such waiver is in writing.

12. APPENDIX

12.1 This agreement includes the following appendix which is attached and incorporated by reference: [appropriate Appendix and reference need to be added]

13. NOTICES

13.1 All written notices shall be directed as follows:

Truckee Donner Public Utility District
P.O. Box 309
Truckee, CA 96160

Customer-generator: _____

Address: _____

14. TERM OF AGREEMENT

14.1 This agreement shall be in effect when signed by the customer-generator and District and shall remain in effect thereafter month to month unless terminated by either party on thirty (30) days' prior written notice in accordance with Section 13.

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15. SIGNATURE

IN WITNESS WHEREOF, the parties hereto have caused two originals of this agreement to be executed by their duly authorized representatives.

This agreement is effective as of the last date set forth below.

Customer-generator

By: _____

Name: _____

Title: _____

Date: _____

Truckee Donner Public Utility District

By: _____

Name: Peter L. Holzmeister

Title: General Manager

Date: _____